USDA FOREST SERVICE
RESEARCH PAPER **NC-175**

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1992 Folwell Avenue
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Manuscript approved for publication October 27, 1978

1979

THE MARKET FOR FOREST AND ASSOCIATED LAND IN SOUTHERN ILLINOIS: IMPLICATIONS FOR LAND MANAGEMENT

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Nonurban, nonagricultural land covers about one-fourth of the State of Illinois and includes forest land, brush land, unimproved pasture, and wasteland. Because most of this land is forested or in the process of returning to forest, we will refer to it as forest and associated land (F&A land) (Beazley 1965, Burde and Baumgartner 1978).

F&A land provides a wide range of goods and services—scenic beauty, outdoor recreation, forage and shade for livestock, wildlife and wildlife habitat, carbon dioxide-oxygen exchange, soil stabilization and improvement, water and watershed regulation, wood and wood products, moderation of solar radiation and wind, and filtering of various sights, sounds, and substances. These goods and services will probably become increasingly important to Illinois residents in the future.

F&A land is found in all regions of the State but mainly occurs in the southern and western portions. It generally lies along rivers and in hilly areas and in tracts that range from several thousand acres to narrow strips along fences, streams, and roadways. Much of the F&A land is intermixed with agricultural cropland.

Most of Illinois' F&A land is privately owned, but many of the benefits that it provides accrue partially to the public. For example, a particular tract may enhance the landscape; influence the quantity, quality, and timing of streamflow; and provide habitat for wildlife.

Because of the significant public benefits from F&A land, a number of public technical and financial assistance programs have been begun to enhance the management and use of the private holdings (Andresen 1972). These programs must be continually updated in terms of demands for the goods and services that the land can produce and the current and expected patterns of resource ownership, owner goals, and ongoing management efforts.

The land market is an important focus for change. It may signal major alterations in owner goals and land use that may have significant implications for resource management and land use. Frequent turnover of private land does not usually contribute to long-term investment in resource development by landowners. Breaking up large tracts into smaller ones may constrain resource management programs. The shift of a substantial amount of F&A land from farm to nonfarm may mark a land use trend toward vacation homes, recreation developments, and rural nonfarm residences.

Those responsible for technical and financial assistance programs are interested in the amount of activity in the land market, as well as the size and characteristics of the tracts exchanged and the goals and management programs of landowners. Various other groups are also interested, particularly if there are indications that F&A land will be

converted to housing or recreation developments. These groups include local government units and others who provide services to rural residents, State and local planning agencies, public resource managers, tax assessors, potential land purchasers and sellers, and wood-using industries.

The increasing public value of F&A land and a large amount of uncertainty concerning its management and use has led to a cooperative research project between the University of Illinois and the USDA Forest Service. The purpose of the project is to analyze trends in the marketing, ownership, management, and use of F&A land and to develop recommendations for enhancing this land's contributions to the people of Illinois. This report presents findings of the study of trends in the market of F&A land.

THE STUDY

We analyzed the market and the implications for resource management of F&A land in two sample counties in southern Illinois. Counties were chosen as sample units because most records on land transactions are kept at that level.

Both of the sample counties—Jackson and Union—have a substantial portion of F&A land, some of which is included in the Shawnee National Forest, and therefore provide reasonable representations of the market for such land in southern Illinois. They differ in that for some time Jackson County has experienced more rapid residential and recreational developments which are just beginning to expand in Union County.

Information was collected from a sample of 869 land transactions in Jackson County and 509 transactions in Union County for the 1968-1974 period. The sample was drawn from all land transactions of 1 acre or more (excluding contract sales, sales involving platted and subdivided town and city lots, and transactions in which money did not change hands—inheritance, trades, and gifts).[1] All purchases by the USDA Forest Service, the city of Carbondale, and a 50 percent sample of the < 1 acre transactions were included. Sample results were subsequently weighted to correct for the different sampling intensities.

Assessor records were used to obtain information on the location and size of the tract sold, amount of the tract classified as improved (crop or tillable) or unimproved (noncrop or nontillable), assessed value of the tract, the sale price and date of sale, and the address of the purchaser. Deed records were used to determine the residence of purchasers. Aerial photographs and plat maps were used to determine the extent of F&A land; the presence or absence of buildings, ponds, and streams; the type of road serving the tract; and the distance of the tract from the city of Carbondale.

IMPLICATIONS FOR MANAGEMENT

Activity in the market for F&A land has significant implications for resource management and use as well as public policy aimed at influencing management and use. Important considerations include the types of land sold in combination with F&A land, sale sizes, the extent of a tree canopy, water resources, buildings and roads on the tracts, proximity of National Forest land, the turnover of land ownership, residences of the new owners, and the price for which the land was sold.

TYPES OF LAND SOLD

The management and use of a particular tract of F&A land will be influenced by the other land and related resources held by the owner. It is likely that the owner will use all of his resources in a combination that he expects to best meet his goals. Under these circumstances, the management and use of F&A land would depend, in part, on the management and use of other resources held by the owner. For example, a 5-acre woodland on a hill in the center of a 650-acre farm, nearly all of which is in row crops, is likely to be managed and used differently than a 5-acre rural homesite that was the only land held by its owner.

[1] *It was noted during the study that a number of land transfers took place as the result of contract sales and inheritances. However, these transactions were not included in the study because sale prices were not available.*

A large portion, 70 percent, of the tracts sold in Jackson and Union Counties included some F&A land, often in combination with other types of land, particularly cropland. Less than 10 percent of the sales were entirely F&A land (table 1).

Table 1.—*Tracts sold in each category, 1968-1974*
(In percent of sales)

Land category	Jackson County	Union County	Total
F&A land combined with cropland	52	67	58
F&A land combined with another type of land excluding cropland	7	2	5
Entirely F&A land	11	5	9
No F&A land	30	26	28

SALE SIZES

The acreage of F&A land contained in an individual sale averaged only 20 acres in Jackson County and 25 acres in Union County but ranged up to several hundred acres. Of the sales that included F&A land, half had less than 10 acres of F&A land (table 2). The portion of the land sold that was F&A land averaged 31 percent in Union County and 38 percent in Jackson County. Thus, it can be expected that management of the F&A land resource that was sold will involve a number of small tracts where small acreages of F&A land are found in combination with other land resources, particularly agricultural cropland. This may complicate public assistance programs.

Table 2.—*Extent of F&A in tracts sold in Jackson and Union Counties, Illinois, that included some F&A land, 1968-1974*
(In percent of sales)

Acres of F&A	Jackson County	Union County	Total
1-9	51	45	49
10-19	14	19	16
20-29	9	8	9
30-39	6	7	6
40-49	3	4	3
50-59	2	3	2
60-69	2	3	2
70-79	2	3	3
80-89	2	1	2
90-99	3	1	2
100+	6	6	6

TREE CANOPY

Most of the F&A land sold in Jackson (85 percent) and Union (83 percent) Counties was covered by a tree canopy. The F&A land that does not support a canopy is for the most part retired pasture and cropland that is in the process of returning to forest. The rather small amount of F&A land not covered by a canopy suggests that little cropland and pasture has been retired recently from active agriculture on the tracts that were sold. This is attributable in part to high crop prices in recent years and economies of scale in farming that tend to keep cropped areas large.

The presence of a tree canopy over much of the area has implications for management and use. The trees offer a potential for conversion to wood products, influence wildlife habitat and the environment for recreation, and affect the quantity and quality of streamflow. The flows of these goods and services are heavily influenced by resource management programs undertaken by the owner. Due to the large extent of tree canopy, it is not likely that tree planting will be a major activity.

WATER RESOURCES

More than one-fourth of the tracts sold included streams or ponds (table 3). F&A land is often located adjacent to streams because those areas are not suitable for agriculture. Some ponds are surrounded by F&A land, but others are in more "open" areas. The presence of these resources may have a significant impact on the management and use of F&A land. The forest-water interface is a key habitat for wildlife and often a desirable environment for recreation.

Table 3.—*Land sales in Jackson and Union Counties, Illinois, that included a pond or stream, 1968-1974*

(In percent)

Number of ponds	Jackson County		Union County	
	stream	no stream	stream	no stream
none	14	72	10	65
1	4	8	3	15
2	(1)	1	2	4
3	0	(1)	1	0
4	0	(1)	(1)	(1)
5 or more	0	(1)	(1)	(1)

[1] Less than 0.5 percent.

BUILDINGS

Buildings were located on 48 percent of the tracts sold in Jackson County and 49 percent of the tracts sold in Union County. The presence of buildings may influence the management and use of the land, particularly if the buildings can be used as permanent or seasonal residences.

ROADS

Accessibility by automobile may have a significant influence on the use of a tract, particularly for recreational or residential purposes. Nearly three-fourths of the tracts sold in Jackson County and nearly four-fifths of the tracts sold in Union County were accessible by road. The type of roads that serve the land areas sold are shown below:

Type of Road	Jackson County	Union County
	(Percent of sales)	
None	26	19
Unimproved	4	1
Gravel or stone	38	38
Bituminous	12	21
Paved	16	16
Divided	(2)	1
Municipal	4	4

[2] Less than 0.5 percent.

PROXIMITY TO A NATIONAL FOREST

Shawnee National Forest land accounts for 11 percent of Jackson County and 13 percent of Union County. Approximately 10 percent of the land sold in Jackson and Union Counties had at least one common border with the Shawnee. Even though these tracts are usually in remote and heavily forested areas, many recreationists may be attracted to them by the nearby National Forest. Also, the Forest Service may someday wish to acquisition adjoining tracts. Therfore, proximity to National Forest land may influence how this F&A land is managed and used.

TURNOVER OF LAND OWNERSHIP

During the period 1968-1974, average annual land sales of 1 acre or more—excluding sales involving platted and subdivided town and city lots, transactions in which money did not change hands (inheritance, trades, and gifts), and contract sales —accounted for an average of 3 percent of the land in Jackson and Union Counties. This is a conservative estimate of the total amount of turnover because inheritance was excluded but is likely to be an important source of ownership turnover due to the high ages of many owners (Beazley and Holland 1973, Neuzil 1970, U.S. Bureau of Census 1977).

During the period 1968-1974, an average of 258 tracts that contained some 7,460 acres of F&A land were sold in Jackson and Union Counties each year.

No trend is evident in the acreage of F&A land sold in Jackson and Union Counties annually for the period 1968-1974. The average acreage of F&A land per sale has not shown a clear trend nor has the percent of the average sale consisting of F&A land. The portion of the tracts sold that contained F&A land has likewise shown no significant trends (tables 4 and 5).

When forest and associated land is sold, a significant change in resource use and management may occur. Studies of owners of similar resources in Illinois and elsewhere have indicated a wide range of goals, objectives, and uses. Many of the

Table 4.—*Land market activity, Jackson County, Illinois, 1968-1974*

Year	Sales			Acres sold		Average size of sale		Land tracts that include some F&A land
	All	Those including F&A land		All	F&A land	All	F&A land	
	Number		Percent			Acres		Percent
1968	153	106	46	10,808	5,027	71	33	69
1969	165	99	42	7,732	3,289	47	20	60
1970	166	95	41	6,620	2,696	40	16	57
1971	234	153	33	10,714	3,542	46	15	65
1972	298	215	49	11,712	5,758	39	19	72
1973	329	227	44	11,761	5,171	36	16	69
1974	267	177	30	11,463	3,504	43	13	66

Table 5.—*Land market activity, Union County, Illinois, 1968-1974*

Year	Sales			Acres sold		Average size of sale		Land tracts that include some F&A land
	All	Those including F&A land		All	F&A land	All	F&A land	
	Number		Percent			Acres		Percent
1968	115	93	46	9,070	4,149	79	36	81
1969	138	90	36	7,314	2,657	53	19	65
1970	115	84	35	6,274	2,214	54	19	73
1971	125	85	40	7,808	3,090	62	25	68
1972	161	127	35	11,213	3,939	70	24	79
1973	202	146	31	10,122	3,155	50	16	72
1974	149	118	44	9,321	4,133	63	28	79

goods and services provided by this land accrue to the public at large rather than to the individual owner. Thus, the financial returns to the owner are in many cases low, and are not likely to play as strong a role in resource management as is usually the case with cropland. This makes it difficult to predict the management and use of F&A land.

On the average, the transactions sampled were representative of the land in Jackson and Union Counties in that they had a similar portion of unimproved and improved land. However, it is clear that the sale of highly-productive farms in the lowland along the Mississippi River was less active and land sales near large urban centers were more active than other holdings.

It should be noted that the tracts studied are a sample of tracts that sold, not of all tracts. The tracts that sold are of particular interest because they are the potential focus for change in the management and use of F&A land and present new opportunities for public assistance programs.

With the long-term nature of forest growth, the turnover of owners of F&A land has additional implications for resource management and use. Owners that expect to sell their land after a short time may be unwilling to invest in forest management such as tree planting that bring returns in the future.

We did not look at the breakdown of specific tracts of land. However, the time series in land market activity was examined and no trend toward increased number of sales or smaller sales

was found. Thus, it appears unlikely that there is any accelerated fragmentation in the ownership of the F&A land resource.

LOCATION OF PURCHASERS

Purchasers from the local area predominated in the land market. Residents of the same or adjacent counties where the land was purchased accounted for 70 percent of the acres purchased in Union County and 67 percent of the acres purchased in Jackson County (table 6). The concentration of owners in the local area should facilitate public service programs aimed at landowners. More distant or "absentee" owners may present a more difficult problem in programs where personal contact is important.

The percentage of F&A land purchased by residence of owner did not differ substantially from the distribution of total acres sold (table 6). The one significant exception in both counties is that the USDA Forest Service purchased tracts with a high portion of F&A land.

Table 6.—*Residences of land purchasers in Jackson and Union Counties, 1968-1974*
(In percent)

Purchaser	Purchases No.	Purchases Acres	F&A land
UNION COUNTY			
Union County	73	55	47
Adjacent counties	11	15	15
Madison and St. Clair Counties[1]	2	1	1
Other Illinois	8	14	19
Out of State	5	11	11
USDA Forest Service	1	4	7
JACKSON COUNTY			
Jackson County	77	54	53
Adjacent counties	8	13	13
Madison and St. Clair Counties[1]	2	2	2
Other Illinois	3	2	3
Out of State	5	17	10
USDA Forest Service	4	11	18
City of Carbondale	1	1	1

[1] Part of the St. Louis standard Metropolitan statistical Area, the nearest such area to the study counties.

PRICES

Prices are a guide to the value that purchasers place on F&A land and offer some indication of expected use of the resource. Because F&A land is usually sold in combination with other types of land, it is difficult to identify what is being paid for a particular type of land. However, the following subsample of sales was identified that consisted entirely of F&A land or entirely of cropland that had no buildings .

	Jackson County	Union County
FOREST AND ASSOCIATED LAND		
Number of Sales	23	5
Mean Price	$351	$216
Standard Error	$132	$ 74
0.95 Confidence Interval	$78-624	$11-422
CROPLAND (IMPROVED)		
Number of Sales	112	51
Mean Price	$1,630	$867
Standard Error	$163	$145
0.95 Confidence Interval	$1,307-1,725	$575-1,158

The difference between the mean prices per acre for the two counties is not significant at the 0.95 level.

Prices of cropland varied greatly but generally tended to be higher per acre than F&A land.

The mean price for F&A land is higher than what is usually thought of as being justified by the long-term returns from timber production (Callahan 1966), although because much of the land is covered by a tree canopy, immediate returns from a timber sale may offset part or all of the sale price (table 7).

Table 7.—*Perpetual annual return per acre necessary to provide a present value equal to the purchase price under alternative cost of capital*[1]
(In dollars)

Price per acre	Cost of capital		
	5%	10%	15%
100	5	10	15
200	10	20	30
300	15	30	45
400	20	40	60
500	25	50	75

[1] *Calculated using the formula* $V_o = \frac{r}{i}$

where: V_o = *the initial or present value of a series of payments.*
r = *value recurring annually.*
i = *compound annual rate of interest expressed in decimals.*

Callahan (1966) indicated an average annual return from timber production of $7 per acre per year with a maximum return of $24 per acre per year.

Other sources of revenue from F&A land may include lease or rental for recreational purposes. However, it would most likely be difficult to secure rentals of this magnitude.

SUMMARY

F&A land occupies nearly one-fourth of Illinois. Most of this land is privately owned, but it provides a large number of important public goods and services for which the private owner recieves no revenues. Many public assistance programs are in operation to enhance the management and use of F&A land. These programs must be responsive to changes in public needs, resources, owner goals, and management programs.

One change that has implications for resource management and use is transactions in the land market. An analysis of land transactions in Jackson and Union Counties has indicated that most land transactions include some F&A land. But the amount of F&A land in a sale tends to be small and is often found in association with cropland.

Most of the F&A land sold is covered by a tree canopy and there is not much evidence of land reverting to forest from cropland or pasture. Water resources, including streams and ponds, were located on more than one-fourth of the sales and buildings were located on nearly half of the sales. Roads were found on three-fourths of the tracts. Ten percent of the sales had at least one common boundary with National Forest land.

The price per acre of strictly F&A land varied greatly but averaged $351 in Jackson County and $216 in Union County. These prices exceed what could be justified by past experience with the returns from timber production.

Land changes owners in Jackson and Union Counties at an average annual rate in excess of 3 percent. This tends to create some uncertainty concerning future management and use of these holdings. However, the number of sales and amount of land exchanged shows no significant year to year trends, suggesting that there is no acceleration in the fragmentation of resorce ownership.

Nearly three quarters of the land was purchased by residents of the county where the land was located, and another 10 percent were residents of adjacent counties.

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☆U.S. GOVERNMENT PRINTING OFFICE: 1979--668008/118

Dwyer, John F., and David C. Baumgartner.

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OXFORD: 652.2:911(773). KEY WORDS: Farm, woodlands, land values, land turnover, land markets, woodland management.

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